

ABSTRACT

A beta-phase nickel aluminide (NiAl) overlay coating (24) and method for modifying the grain structure of the coating (24) to improve its oxidation resistance. The coating (24) is deposited by a method that produces a grain structure characterized by grain boundaries (44) exposed at the outer coating surface (36). The grain boundaries (44) may also contain precipitates (40) as a result of the alloyed chemistry of the coating (24). During or after deposition, the overlay coating (24) is caused to form new grain boundaries (34) that, though open to the outer surface (36) of the coating (24), are free of precipitates or contain fewer precipitates (40) than the as-deposited grain boundaries (44). New grain boundaries (34) are preferably produced by causing the overlay coating (24) to recrystallize during coating deposition or after deposition as a result of a surface treatment followed by heat treatment.